REMARKS

The above amendments and these remarks are responsive to the final Office Action dated March 28, 2005. With entry of this amendment, claims 1-12 and 14-26 are pending. Claims 1 and 20 have been amended. Claim 13 was previously cancelled. No new matter has been added by these amendments.

Applicants thank the Examiner for her consideration of the application. In the Office Action, claim 20 is rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,729,631 ("Takahashi"). Claims 1-4, 6-11, 14-19 and 21-26 are rejected under 35 U.S.C. §103(a) as being unpatenable over Takahashi in view of U.S. Patent No. 4,066,332. ("Kato"). Claims 5-12 are rejected under 35 U.S.C. §101 as claiming the same invention as that of claims 3-4 of prior U.S. Patent No. 6,728,032. Applicants respectfully traverse the rejections, but nevertheless amend the claims as indicated above. In view of the remarks below, and the amendments above, Applicants respectfully request reconsideration of the application under 37 C.F.R. § 1.111 and allowance of the pending claims.

Applicants believe this amendment is being timely filed within the two months of the mailing date of the final action, as the two-month deadline fell on a Saturday, May 28, 2005. This amendment was timely filed on the first business day after the Saturday deadline.

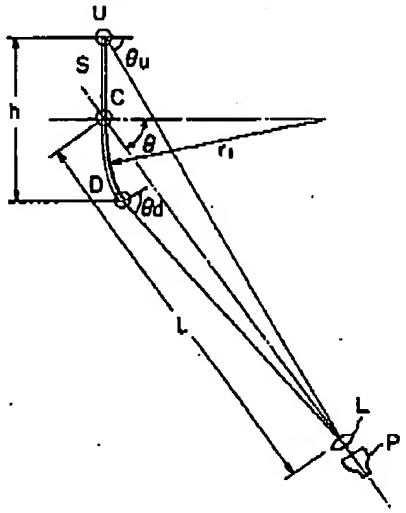
Background

Before responding to the details of the rejection, some brief background information is provided. As discussed in Applicants' specification, the present disclosure relates to a rear projection display system. In one embodiment, the rear projection display system includes a screen comprising a plurality of reflective elements configured to angularly discriminate light without regard to polarity by reflecting light incident on the screen from a first angle toward a rear reflector, and to allow light incident on the screen from a second angle to be transmitted through the screen for display. (Application, Abstract)

The Office Action first applies Takahashi to the claims. Takahashi discloses a rear projection screen that introduces light at a sharp angle from the rear, having a rear surface formed with several parallel extending prisms for refracting and reflecting light rays. (Takahashi, column 3, lines 3-9). As seen in Figure 7, below, which is described as the essential arrangement of the embodiment of Takahashi's invention, light is shown from a light source (P) through a

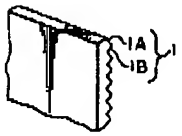
lens (L) onto a rear projection screen (S) that has a cross-sectioned shape which is curved in the lower half section. (Takahashi, column 1, lines 7-12, column 5, lines 19-25). Points U, C, and D were used to measure the efficiency of the light at incidence angle θ. (Takahashi, Column 6).

FIG. 7



Figures 9-14 of Takahashi depict different types of screens formed from a plurality of prisms (1), each having a total reflection surface 1A and an incidence surface 1B on the projection side. The screen may also have a lenticular lens surface 1C extending vertically on the viewing side to impart the horizontally diffusing characteristics of the light. Figure 9 is reproduced below as an example.

FIG. 9



The main object of Takahashi is to "provide a rear projection screen having a rear surface formed with several parallelly extending prisms for refracting and reflecting light rays received from a light source or projector, which can have a relatively high efficiency of light to be viewed." (Takahashi, column 3, lines 3-8). The prisms of Takahashi reflect light as depicted in Figure 4, below. "More specifically, referring to Figure 4, of the light rays α, the part of light rays β reflects upon the light reflection surface 1A of each prism and emerges from the screen as

effective light rays A to be viewed, but the other part of the light rays directly enters into the medium of the screen as stray light rays denoted by the reference character B." (Takahashi, column 2, lines 41-50). Takahashi is directed to overcoming the drawbacks shown in Fig. 4 below.

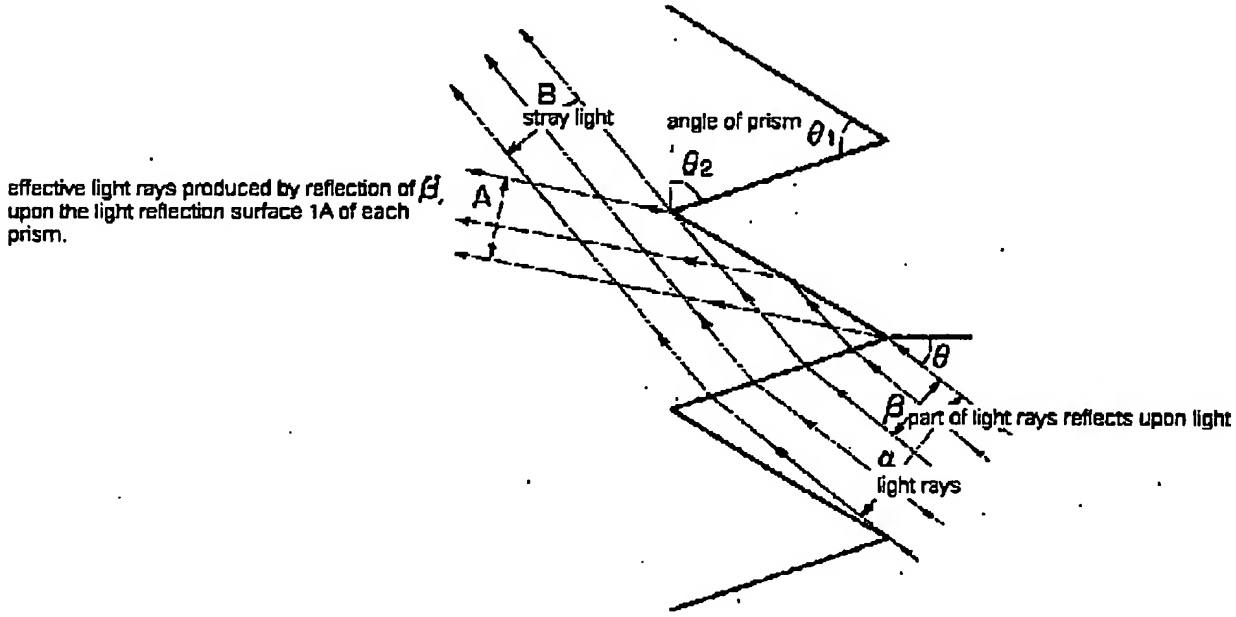


Figure 4 annotated

Takahashi, similar to the above system shown in Fig. 4, includes a rear surface of a rear projection screen with several parallel extending prisms for refracting and reflecting light rays from a light source. The prisms reflect light toward a viewer – not toward a "rear reflector."

Kato discloses a screen for an optical instrument such as a microfilm reader. Kato's screen comprises a light diffusion layer 3 and a light shielding layer (louver) 5 provided in the light diffusion plate vertically with respect to the surface of the diffusion plate 3. (Kato, column 5, lines 45-50). Louvers are described as a number of light-shielding layers in the form of a Venetian blind, which are at right angles to the surface of the screen. (Kato, column 1, lines 59-64). The louvers are opaque to light, preferably of an opaque substance which has a high absorption coefficient, (Kato, column 6, lines 36-44) instead of transparent as in the prior art. (Kato, column 3, lines 40-52). The purpose of the louvers in Kato is to absorb room light so that it is not reflected back to the viewer. (Kato, column 1, lines 60-65 and column 5, line 65 to

column 6, line 2). "Typical examples of materials used to form the louvers in accordance with the present invention are black printers ink, [and] black varnish." (Kato, column 6, lines 39-41).

35 U.S.C. §103(a)

Claims 1-4, 6-11, 14-19 and 21-26 are rejected under 35 U.S.C. §103(a) as being unpatenable over Takahashi in view of Kato. The Office Action states that Takahashi discloses "a rear projection display system (Figure 16B) comprising an image source (P), a rear reflective surface (M), a screen (S) including a lens array (column 7, lines 25-26) and a mirror (M) array positioned adjacent to the lens array (Figures 16A-16C)...in addition to a screen (S) including an internal reflection element (Figure 4) configured to internally reflect light incident the screen (S) from a first angle (θ_1) toward the rear reflective surface, and to transmit incident light from a second angle (θ_2) through the screen (S); wherein the internal elements includes a plurality of prism elements (1) having a generally pyramidal cross-sectional shape (Figure 9)." (Office Action, comments 2 and 4) The Office Action further asserts that the missing plurality of angularly discriminating reflective elements configured to reflect light, having a dark color for improved contrast, wherein the screen includes a plurality of vertical pixels, and wherein said screen is configured to reflect light incident on the screen" is supplied by Kato. (Office Action, comment 4) Applicants respectfully traverse this rejection.

Although it is believed that neither Takahashi alone, or in combination with Kato, discloses all of the elements recited in claim 1, applicants for ease of prosecution have amended claim 1 to include "wherein the rear reflector is spaced from the screen." The Office Action states that Figure 16B contains "a rear reflective surface (M)," however in comment 9, in response to Applicants previous arguments regarding claim 1, the Office Action states that the rear reflector is (1A), which is part of the prism. As can be seen below in Figures 9 and 16B, 1A and M are two different parts of Takahashi's invention. Applicants therefore request clarification regarding which element the Examiner believes is the rear reflector in Takahashi.

FIG. 9

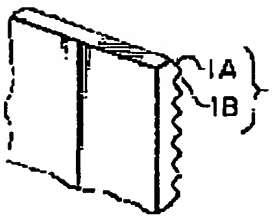
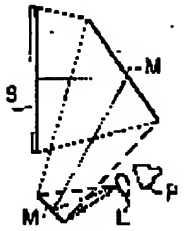


FIG. 16B



Specifically, as shown in Figure 9, above, 1A of Takahashi is part of the screen (S) and therefore clearly is not "spaced from the screen" as required by claim 1, as amended. Similarly, if (M) is the rear reflector, it does not reflect "light incident on the screen from a first angle toward the rear reflector, and to allow light incident on the screen from a second angle to be transmitted through the screen for display" as required by claim 1.

Further, θ_1 of Takahashi, which the Office Action refers to as the first angle, is the apex angle of the prism and θ_2, which the Office Action refers to as the second angle, is the angle of inclination of each prism. (Takahashi, column 5, lines 48-54). These are not angles of reflection and are therefore not reflections toward a rear reflector or light incident on the screen from a second angle. In contrast, only one angle of reflection on M is visible in Figure 16B, where the light is projected from projector (P) through lens (L) to first mirror (M) then to second mirror (M) and through the screen. There is no teaching or suggestion in Takahashi that light incident to the screen is reflected back away from the screen, nor is there a teaching or suggestion of light reflected toward a rear reflector (or even back toward mirror M). The reflection in Figure 4 of Takahashi, above, is forward reflection, not reflection toward a rear reflector "spaced from the screen" as required by claim 1.

Applicants respectfully assert that Kato fails to supply the required reflective elements which reflect light from a first angle toward a rear reflector. Kato discloses a plurality of light absorbing elements (5) or transparent elements (Kato, column 3 lines 40-55 and column 6, lines 36-43) and not "a plurality of reflective elements" as required by claim 1. For a claim to be obvious over a combination of references, the combination of references must teach or suggest

each and every element of the claim. Claim 1 is not obvious over Takahashi in view of Kato because the combination of the references fails to teach or suggest each element of claim 1.

Claim 2 claims "each reflective element includes a reflective surface, each reflective surface being spaced apart from adjacent reflective surfaces." Takahashi fails to disclose, teach or suggest "angularly discriminating reflective elements" configured to discriminate light from a first angle toward a rear reflector and light from a second angle to be transmitted through the screen. Applicants respectfully assert that Kato does not remedy Takahashi's failure to disclose. Element (5) in Kato is configured to absorb light, not reflect light. "Light from the room light 11 illuminating the surface of the screen is generally incident diagonally on the screen, and is *absorbed* by the louvers." (Kato, column 5, line 65-column 6, line 1) "The louvers of the present invention can be formed of any substance which is opaque to light, most preferably an opaque substance which has a high absorption coefficient." (Kato, column 6, lines 36-40). The combination of Takahashi and Kato therefore fails to teach or suggest reflective elements with a reflective surface. The Examiner is respectfully requested to withdraw this rejection.

Claims 3 and 4 both claim further modifications of the reflective surface of the reflective element in claim 2. As Applicants have previously stated, the combination of Takahashi and Kato do not teach or suggest angularly discriminating reflective elements with a reflective surface. Applicants respectfully request this rejection be withdrawn.

Claim 6 claims "wherein each reflective surface is spaced from adjacent reflective surfaces by a distance equal to or less than the height of the vertical pixels." The louvered elements (5) in Kato do not contain reflective surfaces, but absorb light. The combination of Kato and Takahashi therefore fails to teach each and every element of claim 6. Applicants respectfully request this rejection be withdrawn.

Claim 7 claims that "the plurality of reflective elements includes a plurality of prism elements configured to internally reflect light incident on the screen from the first angle toward the rear reflector, and to transmit light incident on the screen from the second direction." As can be seen in Figure 4 of Takahashi, above, no light in Takahashi is reflected backwards. All of the light is reflected forwards to emerge from the screen. "More specifically, referring to Figure 4, of the light rays α, the part of light rays β reflects upon the light reflection surface 1A of each prism and emerges from the screen as effective light rays A to be viewed, but the other part of

the light rays directly enters into the medium of the screen as stray light rays denoted by the reference character B." (Takahashi, column 2, lines 41-50).

In contrast, as shown in Figure 9, below, of the present application, the light is reflected off a separate rear reflector. Kato does not supply the reflection of light from the first angle toward the rear reflector and therefore the combination of Takahashi and Kato does not teach or disclose every element of claim 7. Applicants respectfully request this rejection be withdrawn.

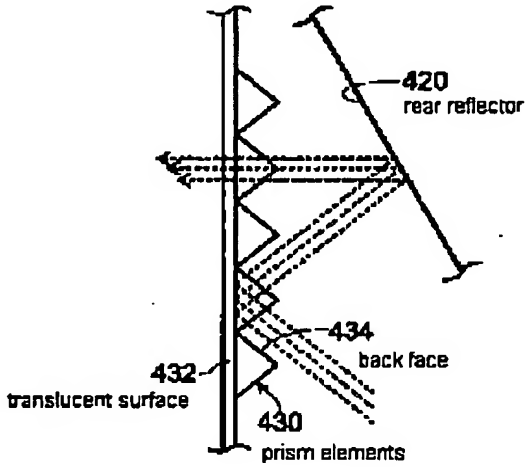


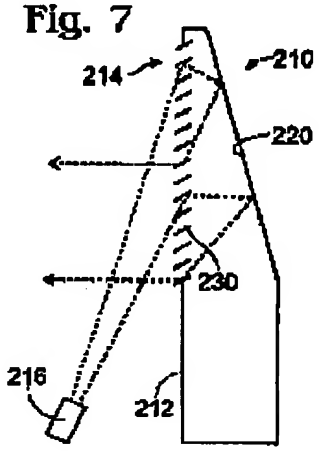
Figure 9 Annotated

Claims 8 and 9 are dependent on claim 7 and claim specifics of the prisms of claim 7. As Applicants previously stated, Takahashi does not teach or disclose "prism elements configured to internally reflect light incident on the screen from the first angle toward the rear reflector" as required by claim 7, and for at least this reason claims 8 and 9 should be allowed. Applicants respectfully request this rejection be withdrawn.

Claim 12 requires "a rear reflector disposed against the back side of the display system." As Applicants discuss above, it is unclear whether 1A or M of Takahashi is the rear reflector. As shown in Figure 9, above, 1A of Takahashi is part of the screen (S) and therefore clearly is not "against the back side of the display system" as required by claim 12. If the rear reflector is M, there is no teaching or suggestion in Takahashi of "a plurality of reflective elements configured to reflect light incident on the screen from an upwardly direction toward the rear reflector and to

transmit light incident on the screen from a downwardly direction between the reflective elements" as required by claim 12 and depicted in Figure 7, below.

Fig. 7



Takahashi therefore does not teach or suggest each element of claim 12. Applicants respectfully request this rejection be withdrawn.

Claims 14 and 15 are dependent upon claim 12 and for at least the reasons cited above should be found to be allowable. Applicants respectfully request this rejection be withdrawn.

Regarding claim 16, the Office Action fails to present an argument in comment 12 regarding Applicants' previous response. Applicants are therefore unable to comment on the rejection and request further clarification.

Claims 17-19 are dependent on claim 16. For the reason cited above, Applicants are unable to respond.

Claim 21 requires "a plurality of reflective elements configured to angularly discriminate light" where light from a first angle is reflected toward the rear reflective surface. As described above, neither Takahashi nor Kato teach, suggest or disclose the elements as recited in claim 21. For a claim to be obvious over a combination of references, the combination of references must teach or suggest each and every element of the claim. Claim 21 is not obvious over Takahashi in view of Kato because the combination of references fails to teach or suggest each element of claim 21.

Claims 22-26 are dependent on claim 21. For at least the reasons cited in claim 21, these claims also should be found allowable. The Examiner is respectfully requested to withdraw this rejection.

35 U.S.C. §102(b)

Claim 20 has been rejected under 35 U.S.C. §102(b) as being anticipated by Takahashi. The Office Action at comment 2 states that Takahashi "discloses a rear projection display system (Figure 16B) comprising an image source (P), a rear reflective surface (M) a screen (S) including a lens array (column 7, lines 25-26) and a mirror (M) array positioned adjacent the lens array (see Figures 16A-16C), wherein the lens array a plurality of lenses (Figure 13) configured to direct light incident from a screen (S) from a first angle onto the mirror array to be reflected toward the rear reflective surface, and wherein the screen is configured to direct incident light from a second angle through the mirror array for display to a viewer." (column 7, lines 34-45; figures 16B and 16C)." (Office Action, comment 2). Applicants respectfully traverse this rejection.

Claim 20 has been amended to claim, "wherein the screen is configured to direct incident light from a second angle through the screen for display to a viewer." As can be seen in Figure 16B, above, of Takahashi, there is only one angle of reflection on M visible and the light is projected from projector (P) through lens (L) to first mirror (M) then to second mirror (M) and through the screen. There is no teaching or suggestion that light incident to the screen is reflected at one angle toward the rear reflective surface and through the screen for display at a second angle. Applicants respectfully request this rejection be withdrawn.

Double Patenting

Claims 5 and 12 are rejected based on 35 U.S.C. §101, double patenting. The Office Action states that claim 5 reads on claim 3 of U.S. Patent No. 6,278,032 and claim 12 reads on claim 4.

Applicants respectfully assert that claim 3 of U.S. Patent No. 6,278,032 requires that "the image source be positioned *within* the casing," whereas claim 5 of the present invention requires that "the image source be positioned *outside* of the casing" and therefore the claims are not drawn to identical subject matter.

Claim 4 of the '632 patent requires the rear reflector be "adjacent" the back side of the display system and that "each reflective element of the plurality of reflective elements is oriented diagonally to a vertical plane of the screen." Claim 12 places the rear reflector "*against* the back side of the display system." Adjacent and against are not synonyms. Claim 12 is therefore not drawn to identical the identical subject matter of claim 4. Furthermore, claim 12 does not require that each reflective element be oriented diagonally to a vertical plane of the screen. For at least these reasons, claims 5 and 12 of the present application are not identical to claims 3 and 4 of U.S. Patent No. 6,278,032. The Examiner is respectfully requested to withdraw this rejection.

Applicants believe that this application is now in condition for allowance, in view of the above amendments and remarks. Accordingly, Applicants respectfully request that the Examiner issue a Notice of Allowability covering the pending claims. If the Examiner has any questions, or if a telephone interview would in any way advance prosecution of the application, please contact the undersigned attorney of record.

CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this correspondence is being transmitted on May 31, 2005, via facsimile to the U.S. Patent and Trademark Office at (703) 872-9306.

Nicole Fye
Nicole Fye

Respectfully submitted,

ALLEMAN HALL MCCOY
RUSSELL & TUTTLE, LLP

B. Anna McCoy
Registration No. 46,077
Customer No. 50488
Attorney/Agent for Applicant(s)/Assignee
806 SW Broadway, Suite 600
Portland, OR 97205
Tel: (503) 459-4141
Fax: (503) 459-4142